Amendment and Response
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Title: AN OPTICAL INTERLINK BETWEEN AN OPTICAL TRANSDUCER AND OPTICAL DATA PORT

IN THE CLAIMS

Please add new claims 42-50.

Please amend claims 20, 28, 34, and 41 as follows:

1-19. (Cancelled)

20. (Currently Amended) A light pipe assembly adapted to optically exchange information between an optical transducer adapted to transmit and receive information optically and an optical data port ~~adapted~~ arranged to communicate with an open environment, the light pipe assembly comprising:

a transmit light pipe adapted to optically transmit information optically transmitted by the optical transducer from the optical transducer to the optical data port; and

a receive light pipe adapted to optically receive information via the optical data port and optically transmit the received information to the optical transducer,

wherein the transmit light pipe is ~~adapted~~ configured to exit and diverge light from the optical data port to the open environment, and wherein the receive light pipe is ~~adapted~~ configured to converge light from the open environment on the optical transducer.

21. (Previously Presented) The light pipe assembly of claim 20, wherein a first end of the transmit light pipe is adapted to be optically coupled to the optical transducer and a second end of the transmit light pipe is adapted to provide a portion of the optical data port.

22. (Previously Presented) The light pipe assembly of claim 21, further comprising:

a first lens provided between the first end of the transmit light pipe and the optical transducer, wherein the first lens is adapted to optically couple the optical transducer to the transmit light pipe and collimate light received from the optical transducer into the first end of the transmit light pipe; and

a second lens provided at the second end of the transmit light pipe, wherein the second lens is adapted to increase an angle of light exiting the optical data port.

23. (Previously Presented) The light pipe assembly of claim 22, wherein the first lens and the second lens of the transmit light pipe are formed as part of the transmit light pipe.

24. (Cancelled)

25. (Previously Presented) The light pipe assembly of claim 20, wherein a first end of the receive light pipe is adapted to be optically coupled to the optical transducer and a second end of the receive light pipe is adapted to provide a portion of the optical data port.

26. (Previously Presented) The light pipe assembly of claim 25, further comprising:

a first lens provided between the first end of the receive light pipe and the optical transducer, wherein the first lens is adapted to optically couple the receive light pipe to the optical transducer; and

a second lens provided at the second end of the receive light pipe, wherein the second lens is adapted to collimate light received at the optical data port into the second end of the receive light pipe.

27. (Previously Presented) The light pipe assembly of claim 26, wherein the first lens and the second lens of the receive light pipe are formed as part of the receive light pipe.

28. (Currently Amended) A method of optically coupling an optical transducer ~~adapted to transmit and receive~~ which transmits and receives information optically with an optical data port ~~adapted to communicate~~ which communicates with an open environment, the method comprising:

receiving light rays from the open environment at the optical data port;

collimating the received light rays into a first end of a receive light pipe;

optically transmitting the received light rays within the receive light pipe to a second end of the receive light pipe;

optically transmitting the received light rays to the optical transducer from the second end of the receive light pipe;

receiving the received light rays at the optical transducer;

transmitting light rays from the optical transducer;

collimating the transmitted light rays into a first end of a transmit light pipe;

optically transmitting the transmitted light rays within the transmit light pipe to a second end of the transmit light pipe; and

distributing the transmitted light rays from the second end of the transmit light pipe, including exiting the transmitted light rays from the optical data port to the open environment and increasing an illumination angle of the transmitted light rays from the optical data port.

29. (Previously Presented) The method of claim 28, wherein collimating the received light rays includes passing the received light rays through a lens at the first end of the receive light pipe.

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Previously Presented) The method of claim 28, wherein increasing the illumination angle of the transmitted light rays includes passing the transmitted light rays through a lens at the second end of the transmit light pipe and diverging the transmitted light rays exiting from the optical data port.

34. (Currently Amended) An optical interlink, comprising:

an optical transducer adapted to transmit and receive information optically;

a light pipe having a first end optically coupled to the optical transducer and a second end ~~arranged~~ configured to provide an optical data port ~~adapted~~ arranged to communicate with an open environment;

a transmit lens ~~adapted~~ configured to increase an angle of illumination of light exiting the optical data port to the open environment; and

a receive lens ~~adapted~~ configured to collimate light from the open environment into the light pipe.

35. (Previously Presented) The optical interlink of claim 34, wherein the light pipe provides bi-directional communication between the optical transducer and the optical data port.

36. (Previously Presented) The optical interlink of claim 34, wherein the optical transducer includes an infra-red transducer.

37. (Previously Presented) The optical interlink of claim 34, wherein the optical transducer includes a receive portion and a transmit portion, and wherein the light pipe includes a receive light pipe optically coupled to the receive portion of the optical transducer and a transmit light pipe optically coupled to the transmit portion of the optical transducer.

38. (Previously Presented) The optical interlink of claim 37, wherein the transmit lens is adapted to increase the angle of illumination of light from the transmit light pipe and the receive lens is adapted to collimate light into the receive light pipe.

39. (Previously Presented) The optical interlink of claim 34, wherein the optical interlink is configured to optically exchange information for a printer, wherein the optical transducer and the light pipe are disposed within the printer and wherein the light pipe is adapted to optically exchange information with the optical transducer and externally of the printer.

40. (Cancelled)

41. (Currently Amended) A method of optically coupling an optical transducer ~~adapted to transmit and receive~~ which transmits and receives information optically with an optical data port ~~adapted to communicate~~ which communicates with an open environment, the method comprising:

receiving light rays from the open environment at the optical data port;

collimating the received light rays into a receive light pipe;

optically transmitting the received light rays within the receive light pipe;

optically transmitting the received light rays to the optical transducer from the receive light pipe, including converging the received light rays on the optical transducer;

transmitting light rays from the optical transducer;

collimating the transmitted light rays into a transmit light pipe;

optically transmitting the transmitted light rays within the transmit light pipe; and

distributing the transmitted light rays from the transmit light pipe, including exiting the transmitted light rays from the optical data port to the open environment and diverging the transmitted light rays from the optical data port.

42. (New) An apparatus, comprising:

a printed circuit assembly;

a direct wire port electrically coupled to the printed circuit assembly;

an optical transducer electrically coupled to the printed circuit assembly;

an optical data port; and

a light pipe assembly optically coupling the optical transducer and the optical data port.

43. (New) The apparatus of claim 42, wherein the optical transducer is adapted to transmit and receive information optically.

44. (New) The apparatus of claim 42, wherein the light pipe assembly provides bi-directional communication between the optical transducer and the optical data port.

45. (New) The apparatus of claim 42, wherein the light pipe assembly includes a transmit light pipe adapted to optically transmit information from the optical transducer to the optical data port, and a receive light pipe adapted to optically receive information via the optical data port and optically transmit the received information to the optical transducer.

46. (New) The apparatus of claim 45, wherein the optical data port is arranged to communicate with an open environment, and wherein the transmit light pipe is configured to exit and diverge light from the optical data port to the open environment, and the receive light pipe is configured to converge light from the open environment on the optical transducer.

47. (New) The apparatus of claim 46, wherein the light pipe assembly further includes a transmit lens configured to increase an angle of illumination of light exiting the optical data port to the open environment, and a receive lens configured to collimate light from the open environment into the receive light pipe.

48. (New) The apparatus of claim 42, further comprising:

a housing having a first side and a second side,

wherein the printed circuit assembly, the optical transducer, and the light pipe assembly are disposed within the housing, and

wherein the direct wire port communicates with the first side of the housing and the optical data port communicates with the second side of the housing.

49. (New) The apparatus of claim 48, wherein the second side of the housing is opposite the first side of the housing.

50. (New) The apparatus of claim 42, wherein the apparatus includes a printer.